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DEVICE FOR THE PROTECTION OF LINEAR TRANSISTORIZED AMPLIFIERS O--ETC(U)  
JAN 78 N A GRISHKO, L I MURATOV, Y N GIL'MAN

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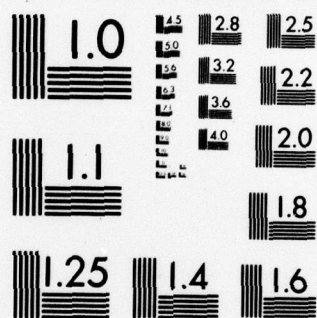
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MICROCOPY RESOLUTION TEST CHART  
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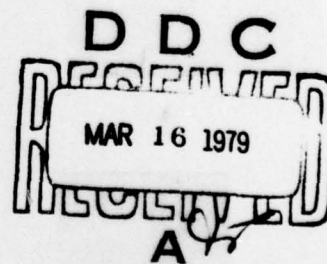
FOREIGN TECHNOLOGY DIVISION



DEVICE FOR THE PROTECTION OF LINEAR TRANSISTORIZED  
AMPLIFIERS OF LONG-RANGE COMMUNICATION FROM SHORT-  
TERM PULSE OVERVOLTAGES

by

N. A. Grishko, L. I. Muratov, Ye. N. Gil'man



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# EDITED TRANSLATION

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By: N. A. Grishko, L. I. Muratov, Ye. N. Gil'man

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# U. S. BOARD ON GEOGRAPHIC NAMES TRANSLITERATION SYSTEM

Block	Italic	Transliteration	Block	Italic	Transliteration
А а	<b>А а</b>	A, a	Р р	<b>Р р</b>	R, r
Б б	<b>Б б</b>	B, b	С с	<b>С с</b>	S, s
В в	<b>В в</b>	V, v	Т т	<b>Т т</b>	T, t
Г г	<b>Г г</b>	G, g	У у	<b>У у</b>	U, u
Д д	<b>Д д</b>	D, d	Ф ф	<b>Ф ф</b>	F, f
Е е	<b>Е е</b>	Ye, ye; E, e*	Х х	<b>Х х</b>	Kh, kh
Ж ж	<b>Ж ж</b>	Zh, zh	Ц ц	<b>Ц ц</b>	Ts, ts
З з	<b>З з</b>	Z, z	Ч ч	<b>Ч ч</b>	Ch, ch
И и	<b>И и</b>	I, i	Ш ш	<b>Ш ш</b>	Sh, sh
Й й	<b>Й й</b>	Y, y	Щ щ	<b>Щ щ</b>	Shch, shch
К к	<b>К к</b>	K, k	Ъ ъ	<b>Ъ ъ</b>	"
Л л	<b>Л л</b>	L, l	Ы ы	<b>Ы ы</b>	Y, y
М м	<b>М м</b>	M, m	Ь ь	<b>Ь ь</b>	'
Н н	<b>Н н</b>	N, n	Э э	<b>Э э</b>	E, e
О о	<b>О о</b>	O, o	Ю ю	<b>Ю ю</b>	Yu, yu
П п	<b>П п</b>	P, p	Я я	<b>Я я</b>	Ya, ya

\*ye initially, after vowels, and after ъ, ы; e elsewhere.  
When written as ё in Russian, transliterate as yë or ë.

## RUSSIAN AND ENGLISH TRIGONOMETRIC FUNCTIONS

Russian	English	Russian	English	Russian	English
sin	sin	sh	sinh	arc sh	sinh <sup>-1</sup>
cos	cos	ch	cosh	arc ch	cosh <sup>-1</sup>
tg	tan	th	tanh	arc th	tanh <sup>-1</sup>
ctg	cot	cth	coth	arc cth	coth <sup>-1</sup>
sec	sec	sch	sech	arc sch	sech <sup>-1</sup>
cosec	csc	csch	csch	arc csch	csch <sup>-1</sup>

Russian      English

rot      curl  
lg      log



DEVICE FOR THE PROTECTION OF LINEAR  
TRANSISTORIZED AMPLIFIERS OF LONG-RANGE  
COMMUNICATION FROM SHORT-TERM PULSE  
OVERVOLTAGES

N.A. Grishko, L.I. Muratov and Ye. N. Gil'man

The invention belongs to the technology of long-range communication and can be used for the protection of input and output circuits of linear transistorized amplifiers.

Known devices for the protection of linear transistorized amplifiers of long-range communication from short-term pulse overvoltages, which contain two nonlinear elements made, for example, in the form of series and counter connected stabilitrons and connected correspondingly to ends of the stationary winding of the linear transformer, introduce additional nonlinear distortions into the channel of the communication equipment due to the presence of a considerable transfer capacitance of the stabilitrons.

For decreasing the nonlinear distortions in the proposed device, between the nonlinear elements there is connected a filter of low frequencies, the common point of which is connected with the middle point of the winding of the linear transformer.

A schematic circuit of the proposed device is given on the drawing.

The device contains a linear transformer 1 of the equipment of long-range communication, condenser 2, which is the cross arm of the filter of low frequencies, longitudinal arms 3 and 4 of the low-frequency filters, and silicon stabilitrons 5 and 6.

The device operates in the following manner.

In the absence of pulses of short-term overvoltages from the direction of the communication line, owing to the presence of a low-frequency filter of the chain of stabilitrons connected in

cross section, the currents of the operating frequency spectrum of the communication system, for example, in the frequency range of 60-801 kHz, are practically not shunted by the device. Therefore, additional nonlinear distortions virtually do not appear.

Since the maximum of energy of the pulses with thunderstorm discharges is contained in the spectrum of frequencies of 700-3500 Hz, then for such a spectrum the filter of low frequencies introduces small attenuation, and if the amplitude of the pulse exceeds the threshold voltage of the stabilitrons the latter are broken down and limit the amplitude of the pulses, which provides the necessary protective action.

Object of the invention.

A device for the protection of linear transistorized amplifiers of long-range communication from short-term pulse overvoltages which contains two nonlinear elements made, for example, in the form of series and counter connected stabilitrons and connected correspondingly to ends of the stationary winding of the linear transformer, which is distinguished by the fact that for the purpose of decreasing the nonlinear distortions, connected between the nonlinear elements is a low-frequency filter, the common point of which is connected with the middle point of the winding of the linear transformer.

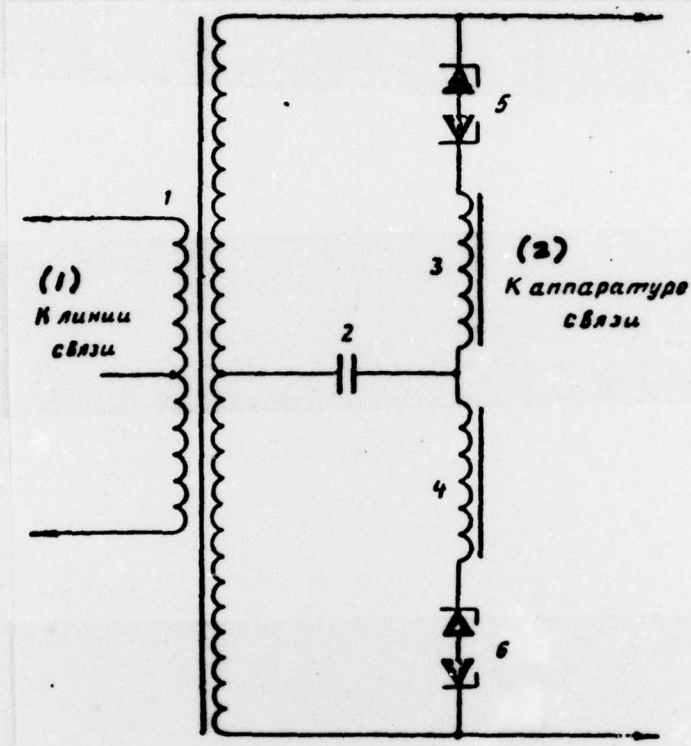


Figure. KEY: 1) To the communication line; 2) To the communication equipment.



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C043 USAMIIA	1	E408 AFWL	1
C509 BALLISTIC RES LABS	1	E410 ADTC	1
C510 AIR MOBILITY R&D LAB/FIO	1	E413 ESD	2
C513 PICATINNY ARSENAL	1	FTD	
C535 AVIATION SYS COMD	1	CCN	1
		ETID	3
		NIA/PHS	1
		NICD	5
C591 FSTC	5		
C619 MIA REDSTONE	1		
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